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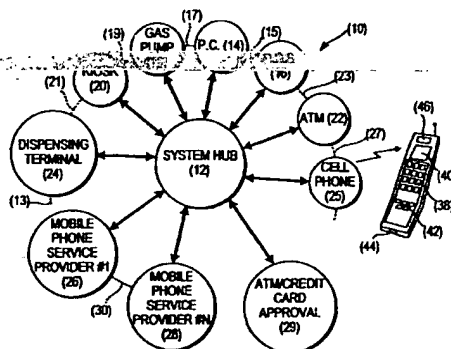
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(54) Title: PRE-PAID MOBILE TELEPHONE AIR-TIME REPLENISHING SYSTEM AND METHOD



(57) Abstract: Air-time for pre-paid mobile telephones, such as cellular telephones, is purchased through a wide variety of User Interface Peripherals (14, 16, 20, 22, 24, 25) by the use of a hub (12) and network connected to the User Interface Peripherals (14, 16, 20, 22, 24, 25). The network is used for selectively communicating with one of several different cellular telephone service providers (26, 28) to relay the information about payment received for additional air-time on a specific cellular telephone. Preferably, the hub (12) comprises a website server or computerized switch which communicates with the User Interface Peripherals (14, 16, 20, 22, 24, 25) and the service providers (26, 28). With this system, various User Interface Peripherals (14, 16, 18, 20, 22, 24, 25) can be used, such as point-of-sale terminals (16) in stores; computers (14) accessing a website; cash-receiving and/or credit card receiving vending machines, such as card-reading gasoline pumps (18), air line ticket vending machines, lottery ticket vending machines, bill-paying machines, check-cashing machines, automatic teller machines (22), cellular telephones (25), dedicated payment-receiving machines, etc. This system and method eliminates the need for the telephone cards, but enables cellular and other mobile telephones to be supplied with air-time from many different locations, by any of a number of mobile telephone service providers.

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PRE-PAID MOBILE TELEPHONE AIR-TIME REPLENISHING SYSTEM AND METHOD

This invention relates to mobile telephones, and particularly to pre-paid mobile telephones in which air-time is purchased in advance of its use, either by cash or by
5 credit/debit or "smart" card payments.

*time purchased
in advanced*

The use of pre-paid telephone cards to enable people to use land-line telephones without using cash or credit cards is well known. Such telephone cards are sold at many retail stores in vending machines, etc. around the world.

Pre-paid mobile telephones, such as pre-paid cellular telephones, also are in
10 widespread use. Most typically, the purchase of telephone cards also is used for replenishing air-time on such telephones. Although this approach is in widespread use, it has distinct disadvantages. It is costly, cumbersome and relatively inconvenient to use. In particular, the cost of supplying and distributing the telephone cards is a very substantial burden on the cellular telephone service providers.

15 This prior approach also has disadvantages to retailers who sell the cards. Maintaining an inventory and providing display space for the cards can be costly. Also, retail losses due to theft and pilferage often are significant.

There are disadvantages to the card users too. Typically, the cards are valid for only one particular cellular telephone service provider. To obtain credit for the purchased
20 pre-paid air-time often requires the purchaser of the card to call a special number provided by the cellular phone service provider and use the keys of their cell phone to key in a code or "PIN" number. Only after this call has been completed and the "PIN" ~~accepted by the cellular phone service provider~~ ~~the cell phone user~~ have use of the air-time purchased. At that point the card is of no further use, and is usually discarded.

25 The essence of this commonly used method of selling pre-paid air-time is that the card is essentially a "token"; the physical manifestation of that piece of information that confirms to the cellular phone service provider that payment has been received for the purchase of a fixed amount of cellular air-time.

Pre-paid telephone systems are known in which such cards are not necessary.
30 However, the number of establishments and locations at which air-time can be replenished are limited. In one such system, for example, selected stores are designated

as locations where customers can purchase pre-paid air-time, and the store will communicate with the service provider who then increases the amount of available air-time for that telephone.

In the latter system, the available air-time or pre-paid funds balance is displayed
5 on the telephone itself. The balance then is reduced by the amount of charges computed
by an on-board computer for each telephone call. When the balance drops to zero, the
telephone is disabled. The amount of time remaining before a required minimum
purchase of air-time is due also is displayed on the telephone display, and the telephone is
disabled when that time expires.

*subtract
from total*

10 One problem with the latter type of replenishing system is the relatively small
number of retail stores at which air-time can be purchased. Replenishment also can be
done by use of a credit card by telephone, but this arrangement does not permit the
payment of cash, as is preferred by many users of such telephones.

Accordingly, it is an object of the invention to provide an air-time supply system
15 and method for pre-paid telephones which solves or alleviates the foregoing problems.

It is a further object of the present invention to provide a system and method
which renders the use of telephone cards - "tokens" representing the payment transaction
- as unnecessary in the process of supplying pre-paid air-time for mobile telephones.

It is a further object of the present invention to provide a system and method for
20 supplying air-time on pre-paid mobile telephones without the use of telephone cards, but
with a substantial increase in the number of locations at which the air-time can be
purchased.

Furthermore, it is an object of the invention to provide a process and system that
reduces the costs incurred by the cellular phone services in manufacturing, storing, and
25 distributing telephone cards; one which simplifies the sales process for the retailer, as
well as eliminating losses due to theft or pilferage.

More particularly, it is an object of the present invention to greatly increase the
number of payment locations available, and to increase the types of such locations
available, as well as to provide access to any of a plurality of service providers from each
30 location.

It also is an object of the invention to provide a system and method for supplying air-time for pre-paid mobile telephones quickly, with great convenience, and at a relatively moderate cost.

5 Additionally, it is an object of this invention to provide a process and system that allows for the purchase of pre-paid air-time from a plurality of service providers, thereby affording greater convenience and choice for the cellular phone customer.

It is also an object of this invention to automate or semi-automate many aspects of the air-time purchase transaction, reducing time and labor costs associated with each individual sale, in some prior systems, and further increasing the convenience of
10 purchasing pre-paid air-time for the customer.

More particularly, it is an object of the present invention to provide for a process and system that may be implemented through a great variety of sales devices, some of which may not require the assistance of a clerk or sales person, in this way greatly increasing the variety and number of locations at which pre-paid air-time may be
15 purchased.

In accordance with the present invention, the foregoing objects are met by the provision of a system and method in which a communications hub is established for communicating between any of a variety of user interface terminals and a selected one of a plurality of mobile telephone service providers.

20 More particularly, the foregoing objects are met by the provision of a process and system in which a networked communications hub is established for communicating between any one of numerous locations and a selected one of a plurality of mobile telephone service providers. For the purpose of this patent application, the devices at these locations will be referred to as "User Interface Peripherals" or, simply,
25 "peripherals". The networked communications hub will be referred to as the "System Hub" or, simply, the "hub".

Apart from communications with cellular phone service providers, the System Hub will also perform sales transaction automation functions and archive transaction data. It will provide accounting, billing, and credits to participants in the transaction, and
30 facilitate credit authorization procedures.

Preferably, the hub comprises a website server or computerized switch which communicates with the User Interface Peripherals and the service providers.

With this system and method, many different User Interface Peripherals can be used, such as point-of-sale terminals in stores; computers (including personal computers, laptops, personal digital administrators, etc.) accessing a website; cash-receiving and/or credit, debit or "smart" card receiving vending terminals, such as card-reading gasoline pumps, air line ticket vending machines, lottery ticket vending machines, automatic teller machines, cellular telephones, dedicated payment-receiving machines or "kiosks" etc. This system and method eliminates the need for the telephone cards, but enables cellular and other mobile telephones to be supplied with air-time from many different locations by any of a number of mobile telephone service providers.

The foregoing and other objects and advantages will be set forth in or apparent from the following specification and drawings.

IN THE DRAWINGS:

Fig. 1 illustrates schematically a preferred embodiment of the mobile telephone air-time purchase system and method of the present invention;

Figs. 2 and 3 are schematic diagrams for two preferred system Hub configurations in the system of Fig. 1;

Figs. 4 through 10 show typical web pages in an embodiment of the invention using the worldwide web..

GENERAL DESCRIPTION

The system 10 includes the System Hub 12 connected to communicate with each of a plurality of User Interface Peripherals or terminals 14, 16, 18, 20, 22, 24 and 25, and with a plurality of mobile telephone service providers 26 through 28, 1 through "N". The dashed line 30 indicates that other service provider's are connected for communication with the hub 12 but are not shown in Figure 1. Similarly, the dashed lines 13, 15, 17, 19, 21, 23 and 27 indicate that many other User Interface Peripherals are connected in the system but are not shown.

Two alternative embodiments of the equipment forming the hub are shown in Figs. 2 and 3.

Fig. 2 shows a website server used when communication is by way of the worldwide web. The server consists of a computer 32 and a disc file 34. The computer 32 is, for example, a heavy-duty personal computer such as those used in so-called "work stations", and the disc drive 34 can be any of a variety of known devices or groups of devices providing the needed level of data storage capacity. In fact, as the storage capacity per unit of volume of modern storage devices continues to increase, adequate storage capacity may exist in the computer 32 alone, so that the disc file 34 is unnecessary.

In this embodiment, in which communication is by way of the worldwide web, the proprietor or operator of the hub establishes a website which is accessible from any suitably-programmed computer, as well as from other terminals to be described below. Information necessary to complete a purchase of air-time for any particular pre-paid mobile telephone can be transmitted by way of the web to the hub 12.

When the information has been received and verified, it is transmitted, with or without other information developed at the hub, to the particular mobile telephone service provider for the telephone. The service provider then increases the account balance for that telephone.

Payments to the service provider for the air-time and payments to the hub proprietor for its services can take one of a variety of paths to be described below.

The embodiment of Fig. 3 is generally the same as that of Fig. 2, except that communication is over telephone lines or by way of wireless from the User Interface Peripherals to the hub computer 32 and a switch 36 which routes the information to the proper service provider. This is sometimes known as a "switching hub", in which the switch 36 serves, in effect, as a PBX to simply connect a specific peripheral with a specific service provider. Of course, the hub of Fig. 3 can combine the functions of a web server and a switch so as to selectively use either of the different communications modes, if desired.

In both types of hub, interfaces are provided, as necessary, between the peripherals and the hub to convert information sent using one protocol to a form needed for processing in the computer 32 and/or switch 36. Similarly, interfaces are provided between the hub and each of the service providers to ensure transmission of information

to the service providers according to the desired protocol. As it is well known, such interfaces can be formed in software or hardware, as desired.

The process and system of this invention can be implemented in a number of different ways, and incorporating a variety of different components and technologies.

5 However, the various embodiments of this process have some common elements. (1) User Interface Peripherals which have access to a means of transferring data from their remote locations to System Hub; (2) The System Hub which is able to route and transfer bi-directional data from many networked User Interface Peripherals to cellular phone service providers; and (3) Some means of accepting payment from the purchaser that is
10 located at, or in association with, the User Interface Peripherals. As an example, a typical embodiment is described in greater detail below.

A User Interface Peripheral such as a Point of Sale (POS) System, or networked kiosk is programmed to accept information from an air-time purchaser regarding such things as the number of the cellular phone and the amount of pre-paid air-time that he or
15 she wishes to purchase. This data is communicated to the System Hub using any suitable network protocol or data transfer technology.

Data processing and communications functions are performed at the System Hub, according to the requirements of the transaction. Data is routed and communication is established with the appropriate cellular phone service provider, either directly or through
20 a third party, using any suitable network protocol or transfer technology. Preferably, the cellular phone service communicates transaction related information back to the System Hub, and this information is, in turn, routed and communicated back to the User Interface Peripheral that initiated the transaction.

If ATM (debit), credit card or "smart card" approval or authorization is required
25 to complete the transaction, the System Hub initiates data communications with the appropriate authorization entity, either directly or through a third party, as indicated at 29 in Fig. 1. Information is processed and routed to the User Interface Peripheral, as needed.

These processes should be carried out using sufficiently rapid communications technologies so that the data processing needed to complete the purchase is accomplished
30 in "real time" from the standpoint of the customer.

To enable the system to work at numerous sales locations, and to process orders for multiple cellular phone service providers, the System Hub has the ability to log (store) transaction details in a permanent or semi-permanent fashion. Records of such things as sales location, amount, cell phone number and other transaction-related data will create the sales records that allow for revenue distribution among the retail outlets, the cellular phone service provider, and the system proprietor or operator. Processing this data in accounting and report generation software systems are two other examples of the data tracking functions provided by the System Hub.

This process and system is based on the transfer of the actual information needed to confirm to the cellular phone service providers that payment for air-time has been received, and supply them with information identifying the account that should receive the credit. Through the use of networked communications technologies, the information needed to complete the transactions processed, routed and shared almost simultaneously among the cellular phone service provider, the customer, and where a retailer is involved, the retailer too. This "real time" bi-directional communications process renders the isolated "token" of the transaction - the pre-paid phone card - obsolete, while simultaneously the "intelligent" nature of the data processing done by the System Hub allows for selective routing of pre-paid transactions to different cellular service providers. This provides the cellular phone user with greater choice and convenience, due to the fact that a single sales location can process sales for a variety of cellular services.

Due to the ability of the system to be used in conjunction with a wide variety of User Interface Peripherals, the convenience of purchasing pre-paid air-time can be offered in a very large number of different locations.

USER INTERFACE PERIPHERALS

One of the advantageous features of the inventions is that it can accommodate a wide variety of both existing and new User Interface Peripherals, making air-time replenishment more convenient, faster, less costly and available in many retail locations that previously could not offer this service.

Referring to Fig. 1, the types of User Interface Peripherals usable in this invention include computers of various sizes and types (e.g., mainframe, personal or workstation computers; laptops and palmtops) mobile computers such as "personal digital

administrators, point-of-sale ("POS") terminals 16; gasoline pump dispensing terminals 18 (including those operable by means of a personal electronic key); dedicated kiosks or similar unattended terminals 20; other dispensing machines 24; automatic teller machines ("ATM's") or bill-paying, check-cashing, or cash dispensing machines 22; and specially
5 programmed mobile telephones 25.

It should be understood that this list is not exhaustive, and that, in general, virtually any device that can be connected to a data communications network, incorporates some type of display mechanism for user prompts, and has a means for collecting payment from the customer can be used as a terminal for sale of pre-paid air-
10 time.

Devices such as the kiosks 20 can be built specifically for this application, or existing systems can be modified so as to use this invention. In any event, the modifications of the equipment needed to perform the additional functions described herein will not be described in detail, as they will be readily apparent to those skilled in
15 the art.

Transaction process flow, user prompts, and available features will vary according to the User Interface Peripheral employed. Additional functions, such as the ability to print out a receipt for the air-time purchased, will enhance the service in some User Interface embodiments.

20 Point-Of-Sale Terminals

A "POS terminal", as that term is used in this patent application, is intended to mean a terminal in a store or similar establishment which usually is operated by a clerk. Thus, it is a "manned" terminal, as opposed to one operated by the customer.

Some existing POS systems already feature network connections as part of their
25 design. In this type of POS system, it is believed to be possible to adapt the operating software used by the terminal to incorporate air-time sales, with only relatively minor modifications. According to the characteristics of the hardware and software of the POS system, it might be either the customer or the store clerk that inputs data and processes the air-time purchase transaction.

30 In other cases, where the POS system has no data communications facility built in, additional data communications or networking hardware may need to be installed to

enable the terminal to sell air-time. Such a "black box" addition to the POS system may incorporate a variety of features and functions, depending on the characteristics of the POS system. Examples of some of these features include a network connection, a dedicated phone line, a keypad, a display element for user prompts, a credit card reading
5 mechanism, and a receipt printer.

In transactions initiated from a POS system, the intrinsic data logging functions of the System Hub will ensure that the store location and other pertinent information is captured for the purposes of accounting and/or revenue distribution.

Following is an example of how a typical point-of-sale terminal can be used. To
10 start, the operator depresses one key or a specific combination of keys on the terminal to enter into the air-time purchasing mode of operation. If the terminal is of the type that has so-called "soft keys" which can be programmed for special purposes, one or more of the soft keys can be used to enable this operation.

Then, the clerk will input the telephone number for the telephone being
15 replenished, the dollar value of the air-time being purchased, and the method of purchase, whether by the payment of cash, credit card, debit card, "smart card", or other means.

If a credit, debit or "smart" card is presented, it is passed through a card validator unit of the type already present in most retail establishments that accept such cards. A separate validation routine will be performed on the card to insure that the card has not
20 been cancelled, that the card holder has not exceeded his or her credit limit, and that there are funds sufficient to cover the purchase.

Then, the operator of the terminal uses one or more keystrokes on the keyboard of the POS unit to transmit the information to the hub 12, where the information is handled in the manner described above, except that the identity of the store in which the POS
25 device is located also is stored and the information is sent to the appropriate service provider.

If the POS terminal has no display other than a simple liquid crystal display, prompts indicating the information to be input are made on that display.

If the terminal has the capability of displaying entire web pages, then it can be
30 used by connecting it to the hub through the internet, in the manner of a Kiosk or personal computer, as described elsewhere herein.

In the case of a POS terminal, connection into the internet does not require the use of a web browser, as might be required for most people using an ordinary PC. Instead, a direct dial connection can be made automatically when the unit is programmed to operate in accordance with this invention.

5 The store in which the POS terminal is located earns its usual fee for selling the air-time, and payment is made to the retailer who then forwards the funds to the service provider. The service provider then sends funds to the hub proprietor or operator to cover its fees for the transaction.

10 In order to save the clerk the time and trouble of inputting the cellular telephone number, the customer can present a card which has a recording on a magnetic stripe of the cellular telephone number. A card reader of the type used for credit verification can be used to read the number into the terminal.

15 Alternatively, the telephone number can be printed on the telephone itself in an easily accessible place in machine-readable form. Then, a code reader, such as a bar-code reading wand, can be used to read the bar-coded information and thus input it into the POS terminal without the use of any keystrokes.

DISPENSING TERMINALS

20 Various dispensing terminals which are adapted to accept payment, either in the form of cash, or credit/debit cards, also can be used as User Interface Peripherals in accordance with the present invention. An example of one such dispensing terminal are the gasoline pumps 18 that incorporate payment by the use of a credit/debit card or "smart card" readers.

25 Gasoline pump terminals of this type already incorporate data communications, display and receipt printing features as a part of their design. Therefore, it is believed that modifications required to enable them to sell air-time are relatively minor.

30 In accordance with this invention, each gasoline pump terminal preferably is programmed to be usable, at the choice of the user, either to enable the pumping of gasoline, or the purchase of air-time for the mobile telephone. Ideally, it can be programmed to enable the performance of both functions simultaneously so that the automobile owner can refill his or her mobile telephone with air-time while gasoline is being dispensed.

In this case, the programming of the terminal is such as to enable the prompts used in other embodiments of the invention to be displayed sequentially on the LCD display provided with such terminals.

Other dispensing devices which can be used as User Interface Peripherals include
5 airline, railroad and other ticket dispensing machines. Such device usually accepts credit, debit or "smart" cards for payment for the tickets and many are already linked to a data communications network.

Thus, they can be converted to operate like the gasoline pump terminals to enable the purchase of air-time on the same terminals which are used to dispense tickets.

10 The transportation ticket dispensing terminals are particularly conveniently located for the traveler to replenish the air time in his or her mobile telephone. Often, it is at an airport or railroad station where it is first noticed that the air-time supply is low and needs replenishment.

Many other ticket vending machines, such as Lotto or other lottery ticket
15 dispensing machines, are set up to accept cash in the form of paper currency and/or coins. The same is true for bill-paying and check-cashing machines. Such machines often are conveniently located for patrons that prefer to pay cash or must purchase air-time with cash, so that these purchasers have options other than POS terminals at which to pay cash for more air-time. The programming modifications of the equipment needed to perform
20 the additional functions described herein will not be described in detail, as they will be readily apparent to those skilled in the art.

All of the dispensers (other than gasoline pump terminals), which are usable as User Interface Peripherals are represented collectively by the circle 24 in Fig. 1.

Internet Kiosks

25 An excellent example of a User Interface Peripheral is the rapidly-proliferating kiosk for public Internet access. Each of these kiosks usually is equipped with a large color monitor and a touch-screen interface and is linked to a data communications network. Some varieties include audio prompts and feedback, and it is believed that future versions will accept spoken commands for user input. All have some form of
30 credit/debit or "smart" card reading mechanism, and many produce printouts of good quality.

Accessing the Web using TCP/IP communications protocol, this embodiment of a User Interface Peripheral allows the customer to access a web deployed System Hub, using the touch-screen and web browsing software to purchase air-time. The user friendliness of these machines make them an attractive and pleasant example of

5 "unmanned" embodiments of air-time sales devices.

If desired, cash acceptors can be added to enable them to accept cash, in addition to credit, debit or "smart" cards.

Figs. 4-10 of the drawings show sample website pages for use in such an internet kiosk. The website pages give prompts specifying the information needed.

10 First, as shown in Fig. 4, the user selects the cellular telephone service provided from a list given on the screen. The selection is made by touching the appropriate area of the touch-screen.

Thus, in the example of Fig. 4, the user can select one of three service providers, "E-Point"; "Abco"; or "XYZ". It should be understood that, although only three services

15 providers are listed in this example, many others can be listed.

Referring to Fig. 5, the next screen is that of the XYZ Company, which was selected by the user. In this screen, the user is asked to enter the cellular phone number. The next screen, shown in Fig. 6, identifies the user and asks for confirmation of the identification.

20 The next screen (Fig. 7) asks for the amount of pre-paid air time to be purchased. The following screen (Fig. 8) asks for confirmation of that amount.

The next screen (Fig. 9) asks for payment, either by cash or credit card, and the final screen (Fig. 10) confirms the purchase.

If desired, a PIN number for the user and credit card also can be requested, for

25 security purposes. The PIN number and credit card numbers are encrypted by standard software available for the purpose, to protect against theft.

The hub computer processes the information it receives, and then forwards it to the proper service provider, which increases the balance in the account for the phone, and sends a confirmation signal through the hub 12 to the terminal which displays

30 confirmation of the purchase amount as in Fig. 10. Also, the current balance in that account can be shown, if desired.

The telephone owner then can make calls in the same manner as if replenishment of air-time had been accomplished by way of the usual telephone card.

Computers

When computers 16 are used as the peripherals, they require software such as browsers or other means to access the internet. Otherwise, they are used in substantially the same way as the Internet kiosk described above.

Many computers do not use touch-screens. In those cases, selections of screen options can be made by using cursors, a computer "mouse", a track ball or the like, and the input of data is by way of a keyboard, voice-recognition software, etc.

10

Mobile Telephone

Another device which can be modified to be used as a User Interface Peripheral in the present invention is a mobile telephone 25 itself. As it is well known, and as it is shown in Fig. 1, the cellular telephone has a keypad 38, a display screen 40, and a number of function keys 42, in addition to a microphone inlet 44 and a speaker outlet 46.

15

The telephone preferably is of the type containing an entire micro-computer which can be used to perform various functions, like a palmtop or laptop computer.

Each cellular telephone can be programmed, preferably when manufactured, so as to operate in the following manner.

20

A function key or key combination can be pressed to switch the telephone into the air-time replenishment mode. When this mode is enabled, the telephone automatically calls and makes wireless communication with the hub.

25

Next, the prompts for the required information are displayed on the display screen 40 of the telephone, and the keypad is used to input the alphanumeric characters to be transmitted to the hub. Encryption software is included in the telephone to provide encryption of the credit or debit card number and pin number used by the purchaser to pay for the air time.

This information is transmitted by wireless to the hub, which then processes the information and transmits it to the appropriate service provider, which then increases the air-time account balance for the telephone.

Although ordinary cellular telephones can be used, it also is possible to use known cellular telephones in which the account balance and time remaining to make a minimum purchase is displayed on the display screen of the telephone.

ATM Machines

5 The omnipresent ATM machine also contains the basic requirements to enable it to dispense pre-paid air-time. Newer versions of these machines are incorporating Internet access as a standard feature, so once again, the purchasing experience would be similar to that of the Internet kiosk.

SYSTEM HUB SERVICES

Credit Approval

10 For purchases of air-time made with a credit/debit card, card validation and credit verification processes are used. Utilizing the System Hub's intrinsic data processing functions, transactions requiring credit approval will be detected and communications will be initiated with the appropriate financial authorization systems, and credit will be
15 verified before the cellular phone service provider is notified of the purchase. Depending on the type of User Interface Peripheral and the data communications technology employed, financial transaction data may be encrypted or otherwise protected.

Routing Functions

20 Selective data processing, with the ability to react appropriately to sales transaction information generated by the many different remote locations, and input through a variety of User Interface Peripherals is highly advantageous feature of the System Hub. An "intelligent" intermediary in the air-time purchase process, these features give the System Hub the ability to route and direct numerous simultaneous transactions to the correct destinations.

Transaction Logging and Accounting

25 Because one object of this invention is to permit "real time" financial transactions to take place in a networked environment, record keeping is a significant capability of the System Hub. Records of all transactions can be archived to a secure data storage mechanism. Accounting and billing functions will be provided for participants in the
30 sales process, allowing for revenue distribution between the participants. Additionally, the data gathered may be used to analyze sales trends, generate marketplace information,

or simply provide a record of the transaction. Taking advantage of this feature, other possibilities include: Report Generation, Remote System Diagnostics, or Data Interfacing with external accounting systems.

Repeat Purchaser Features

5 One of the advantages of the present invention is that repeat purchasers of air time using a particular kind of terminal for purchase can significantly reduce the amount of information they must supply when making air-time purchases. In accordance with this feature of the invention, during the first purchase operation, the hub computer stores, in a secure part of memory, the credit card (and pin number, if used) information received
10 from the purchaser, together with the mobile telephone number. When the same customer again seeks to purchase air-time, all he or she need to do is input the mobile telephone number and his or her PIN, and the value of the air time being purchased, and the computer will automatically access the credit card or debit card information.

SUMMARY

15 It can be seen from the foregoing that the objectives set forth above are well satisfied.

 First, the manufacture, distribution, and sale of telephone cards is made unnecessary by this invention.

 Secondly, this system facilitates the sale from a single location of air-time offered
20 by numerous cellular phone service providers, greatly increasing the convenience to the customer.

 Thirdly, the invention embraces a wide variety of User Interface Peripherals and diverse payment mechanisms, facilitating the introduction of air-time sales points into virtually any retail location.

25 The System Hub automates or semi-automates some communications and data handling tasks that previously required several steps and/or human intervention in some prior systems. This service, coupled with routing capabilities that manage and administer the sales transaction in a networked environment, as well as the features noted above, also supply significant improvements over the prior art.

30 The above description of the invention is intended to be illustrative and not limiting. Various changes or modifications in the embodiments described may occur to

those skilled in the art. These can be made without departing from the spirit or scope of the invention.

CLAIMS**WHAT IS CLAIMED IS:**

1. A method of facilitating the acquisition of air-time for pre-paid mobile telephones, said method comprising the steps of:

5 (a) providing a hub with means for selectively communicating with a plurality of user interface peripherals and a plurality of mobile telephone service providers;

(b) communicating from a selected one of said user interface peripherals to said hub information identifying a specific mobile telephone unit for which air-time is being purchased, identifying the amount of payment being made for said air-time, and

10 identifying the service provider for said specific mobile telephone; and

(c) sending said information from said hub to said mobile telephone service provider.

2. A method as in Claim 1 in which said communicating step comprises sending said information to said hub from one of said user interface peripherals via the worldwide
15 web.

3. A method as in Claim 1 in which said user interface peripherals include an unmanned terminal selected from the group consisting of: gasoline pump payment terminals; dedicated kiosks; ticket dispensing terminals; automatic teller machines; computers; mobile telephones; check-cashing machines; bill-paying machines and
20 banking machines.

4. A method as in Claim 1 including the steps of approving a credit instrument for use in paying for the air-time being purchased, said credit instrument being selected from the group consisting of: credit cards, debit cards, and smart cards, and directing the payment so approved.

25 5. A method as in Claim 1 including a hub computer at said hub, and including the step of storing credit information for a given telephone in said computer, and accessing said credit information in air-time replenishing operations subsequent to the first one so as to avoid the need to transmit said credit information for each transaction.

6. A system for facilitating the purchase of air-time for pre-paid mobile
30 telephones,

said system including a hub computer and storage means for selectively communicating with each of a plurality of widely distributed user interface peripherals,

said hub computer being programmed to recognize calls for air-time, to store information including the number of the telephone, the amount of money paid for the air-time, and the identity of the service provider for the telephone, and to transmit
5 said information to said service provider.

7. A system as in Claim 6 in which said hub computer and storage means comprise a web server connected to the worldwide web and programmed to provide a website for purchasing said air-time.

10 8. A system as in Claim 6 in which said user interface peripherals include dispensing machines including display means and means for communicating with said hub computer to receive and display prompts seeking said information and confirmation signals, and to transmit said information to said hub computer.

9. A system as in Claim 8 in which said user interface peripherals include
15 machines selected from the group consisting of cash dispensing machines; ticket dispensing machines; stand-alone dedicated air-time dispensers; internet kiosks; bill paying machines; check cashing machines; and gaming ticket dispensers.

10. A system as in Claim 6 in which said hub computer is programmed to encrypt a credit instrument number when transmitted from one of said user interface
20 peripherals numbers to obtain authorization for the amount of money to be charged for said air-time, and to direct payment of said money.

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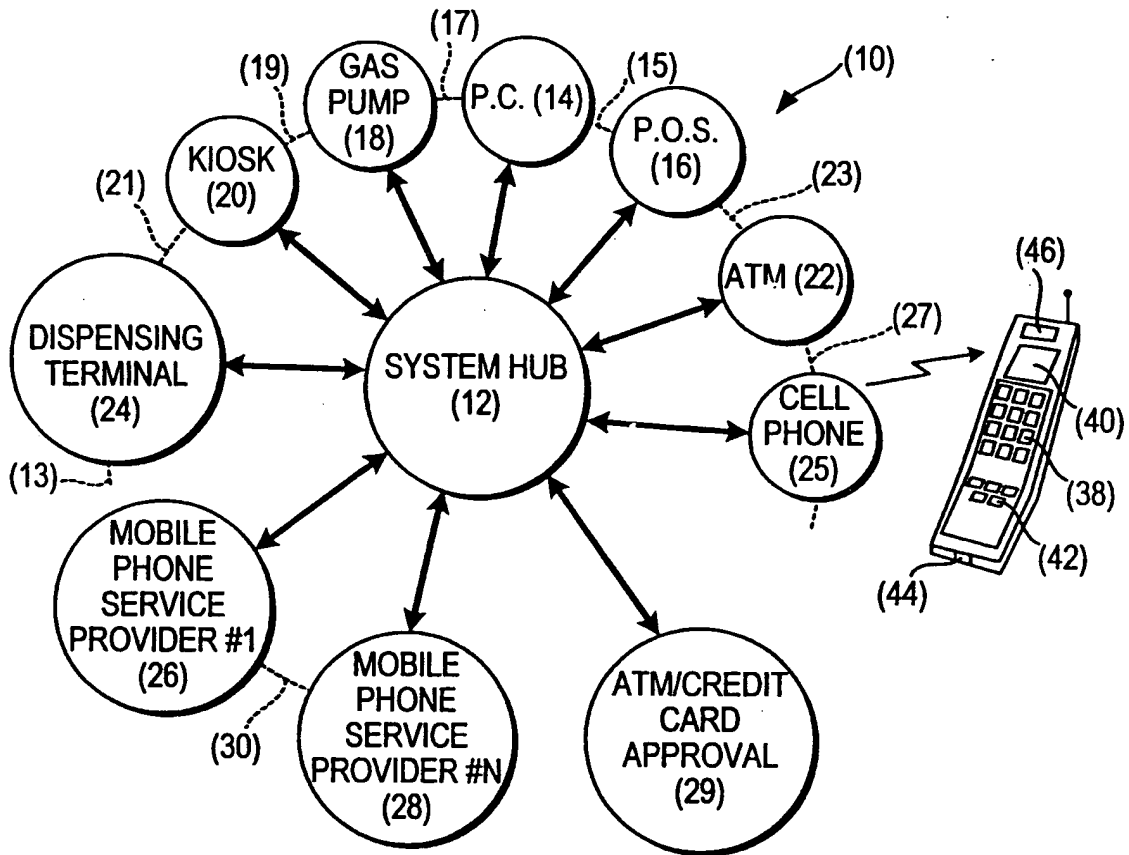


FIG. 1

FIG. 2

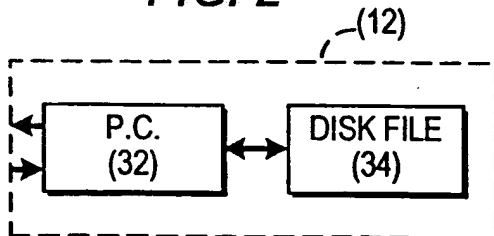
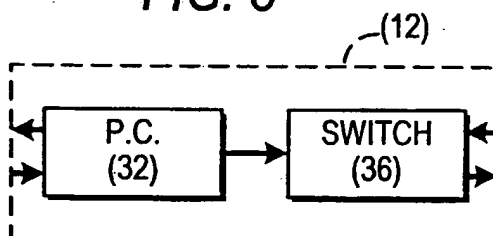


FIG. 3



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FIG. 4

UNIVERSAL CELL PHONE AIR TIME KIOSK

"CHARGE UP YOUR CELL PHONE WITH PRE-PAID AIR TIME AS
EASY AS 1-2-3!"

YOU CAN PURCHASE PRE-PAID AIR TIME FOR YOUR CELLULAR PHONE USING
YOUR CREDIT CARD, ATM CARD OR CASH FROM THIS KIOSK. TIME CAN BE
PURCHASED FROM ANY OF THE COMPANIES SHOWN BELOW. TO START THE
PROCESS, JUST TOUCH THE LOGO OF YOUR CELLULAR COMPANY ON THE
SCREEN!

E - POINT
E - P

AB - COM
AB

XYZ

3/5

WELCOME TO XYZ PRE-PAID AIR TIME SERVICES!
**PLEASE ENTER YOUR CELL PHONE NUMBER BY TOUCHING THE BUTTONS
ON THE SCREEN KEYPAD BELOW!**

1	2	3
4	5	6
7	8	9
	0	

CELL PHONE NUMBER: 7606688

CLEAR **NEXT**

FIG. 5

**XYZ PRE-PAID AIR TIME SERVICES ACCOUNT
CONFIRMATION**

**OUR RECORDS SHOW THAT THE CELL PHONE NUMBER:
7606688 BELONGS TO: BRIAN ROBERTS
IS THIS CORRECT?**

BACK **OK**

FIG. 6

4/5

XYZ PRE-PAID AIR TIME SERVICES AMOUNT TO CREDIT
PLEASE ENTER THE AMOUNT YOU WISH TO CREDIT TO YOU CELL PHONE
NUMBER IN INCREMENTS OF \$10 BY TOUCHING THE BUTTONS ON THE
SCREEN KEYPAD BELOW!

1	2	3
4	5	6
7	8	9
	0	

AMOUNT TO CREDIT: \$

FIG. 7

**XYZ PRE-PAID AIR TIME SERVICES CREDIT
CONFIRMATION**

YOU ARE GOING TO CREDIT THE CELL PHONE NUMBER:
7606688 WITH: \$40

IS THIS CORRECT?

FIG. 8

5/5

<u>XYZ PRE-PAID AIR TIME SERVICES ENTER PAYMENT</u>		
PLEASE SWIPE YOUR CREDIT OR ATM CARD THROUGH THE READER, OR INSERT CASH IN THE CASH TRAY FOR THE AMOUNT YOU SELECTED AMOUNT OF PAYMENT: \$40 WHEN YOU ARE FINISHED PLEASE TOUCH THE 'OK' BUTTON TO FINISH YOUR TRANSACTION!		
<table border="1"><tr><td>BACK</td><td>OK</td></tr></table>	BACK	OK
BACK	OK	

FIG. 9

<u>UNIVERSAL CELL PHONE AIR TIME KIOSK</u> <i>THANK YOU BRIAN ROBERTS!</i> YOUR XYZ CELL PHONE HAS BEEN CREDITED WITH \$40 OF PRE-PAID AIR TIME! ENJOY! AND REMEMBER, CHARGING UP YOUR AIR TIME IS NOW JUST AS EASY AS FILLING UP WITH GAS!			
AB - COM AB	E - POINT E - P	<table border="1"><tr><td>XYZ</td></tr></table>	XYZ
XYZ			
<table border="1"><tr><td>HOME</td></tr></table>			HOME
HOME			

FIG. 10

INTERNATIONAL SEARCH REPORT

international application No.
PCT/US00/20608

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : H04M 11/00 US CL : 455/406 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 455/406,405,408,409,414,407,410,426; 379/112,114,121,144,127; 235/380-382.5 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P ----- Y,P	US 6,058,300 A (HANSON) 02 MAY 2000, SEE ABSTRACT	1,3,8,11-12,15,17 ----- 2,4-7,9-10,13-14,16 AND 18-25
Y,P	US 6,084,953 A (BARDENHEUER ET AL.) 04 JULY 2000, SEE ABSTRACT	2,4-7,9-10,13-14,16 AND 18-25
Y,P	US 6,032,859 A (MUEHLBERGER ET AL.) 07 MARCH 2000, SEE ABSTRACT	13
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "Z" document member of the same patent family	
Date of the actual completion of the international search 08 SEPTEMBER 2000		Date of mailing of the international search report 13 DEC 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer MARSHA D. BANKS-HAROLD Telephone No. (703) 305-4700 <i>Karen S. Ward</i>